

REMARKS/ARGUMENTS

This amendment is submitted in response to the Final Office Action mailed August 3, 2005. Claims 24-26, 28-31, 34-37, 38 and 39 are currently pending in the application. Claims 24-26, 31 and 34-37 stand rejected.

Applicant has amended claims 24, 29, 35, and 37 and added new claims 38 and 39. Applicant respectfully submits that these amendments are responsive to the outstanding rejections and place the claims in condition for allowance, for reasons explained in detail below. In view of the above amendments to the claims, Applicant respectfully requests reconsideration of the application as amended herein.

Objection to Claims 35 and 37

Claims 35 and 37 have been objected to because the term, “self-assembly dendrimers” is awkward. Claims 35 and 37 have been amended to change the term “self-assembly dendrimers” to “self-assembling dendrimers.”

Obviousness Rejections under 35 U.S.C. § 103(a)

Claims 24, 25, and 28-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Soane et al. (U.S. Patent No. 5,135,627) in view of either Ekström et al. (U.S. Patent No. 5,376,252) or Kaltenbach et al. (U.S. Patent No. 5,500,071). Dependent claims 26-27 and 34-37 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over these same references, further in view of one or more of Sethi et al. (U.S. Patent No. 4,891,120), Jinno et al. Ross et al., Tanaka et al. and Newkome et al.

Claims 24-26 and 28-31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Clark et al. (U.S. Patent No. 5,194,133) in view of either Ekström et al. (U.S. Patent No. 5,376,252) or Kaltenbach et al. (U.S. Patent No. 5,500,071). Claims 34-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over these same references, further in view of one or more of Jinno et al., Ross et al., Tanaka et al. and Newkome et al.

The above rejections are based on the teachings of Soane et al. and Clark et al., both of which disclose electrophoretic devices having an extended series of electrodes along opposing sides of an electrophoretic channel. The examiner also notes that Soane et al. discloses an

electrode that circumscribes the top, bottom and sides of the channel, in the form of a plate through which a tubular electrophoretic channel passes. The following Figure 1, with each cell representing a distinct electrode, illustrates how such an array in a single channel would appear:

Figure 1

1	2
3	4
5	6

Column 1 (electrodes 1, 3 and 5) represent the electrodes along one side of the channel, while Column 2 (electrodes 2, 4 and 6) represent electrodes along the opposite sides of the channel. The examiner states that the series of electrodes along the sides of the channel satisfies the claim limitation of “a plurality of electrodes within each channel, wherein at least one cathode or anode is disposed in the central region of a channel” (presumably the examiner considers the intermediate electrodes corresponding to electrodes 3 and 4 above to be “central” in the sense that they are between electrodes 1 and 5, and electrodes 2 and 6, respectively). The examiner also states that the teaching in Soane et al. of an electrode that circumscribes the channel satisfies the claim limitation of an electrode “disposed in the central region of a channel” because it surrounds not only the sides of the channel but also the top or bottom of the channel.

Applicant traverses the above rejections, and submits that the meaning of the claims, as previously entered, have been misinterpreted by the examiner, resulting in an erroneous application of the prior art references. Specifically, the examiner has misinterpreted the meaning of Applicant’s claim limitation reciting an electrode “disposed *in the central region* of a channel.” In Applicant’s previous response, dated April 27, 2005, Applicant explained that the prior art references “show only electrodes that are disposed at the *edges* of a channel” and that the present invention includes electrodes that are “positioned *within* a separation channel” (emphasis added), that is, the electrode is disposed between two other electrodes.

In an effort to more clearly and particularly define the novel aspect of the invention, Applicant has amended the two independent claims, claims 24 and 29, to recite a “plurality of electrodes positioned in a spatially-dispersed array within each channel, wherein the array comprises a plurality of electrodes defining a perimeter of the array and at least one electrode disposed in a central region within the perimeter of the array.” Applicant respectfully submits that the above claim amendments more particularly and clearly define an electrode array that includes an electrode in a central position relative to electrodes at the perimeter of the array, which structure is distinguishable over the cited prior art. To illustrate, one particular embodiment of the present invention is an array of electrodes having a series of three columns and three rows of electrodes, with the middle electrode disposed in the central region of the array, as illustrated in the following Figure 2.

Figure 2

1	2	3
4	5	6
7	8	9

Figure 2 illustrates a 3×3 array within a channel, with each cell representing a different electrode. Electrodes 1, 2, 3, 4, 6, 7, 8, and 9 define the perimeter of the array, analogous to that described in Soane et al. and Clark et al., with each row representing opposing electrodes on opposite sides of the channel. Claims 24 and 29 of the present invention, however, require that the array include “at least one electrode disposed in a *central region within the perimeter of the array*,” which describes electrode 5 in Figure 2. Particular embodiments of a two-dimensional array having “at least one electrode disposed in a central region within the perimeter of the array” are described, for example, in the specification in Figures 2A, 5, 6, 8A, 8B, 8C, 8D, 8E, and 10.

For purposes of clarification, Applicant previously argued that the electrode array of the present invention includes an electrode *within* the channel. Electrode 5 is *within* the channel in the sense that it constitutes an electrode that is in a central location within the channel defined by

a plurality of perimeter electrodes, electrodes 1, 2, 3, 4, 6, 7, 8 and 9. It is understood, of course, that the array of the present invention may include more than 9 electrodes, or less than 9 electrodes, provided at least one electrode is in a central location relative to the electrodes that define the perimeter of the array.

The claims of the present invention are distinguishable over Soane et al. and Clark et al. because they recite additional structure not disclosed in Soane et al. or Clark et al. – namely, “at least one electrode disposed in a *central region within the perimeter of the array*.” Although the electrode arrangement of both Soane et al. and Clark et al. does define a plurality of electrodes, which could arguably be considered an “array,” all the electrodes are at the perimeter of the channel. Neither Soane et al. nor Clark et al. disclose any electrodes in a central region within the perimeter of this array.

The examiner has further suggested that the circumscribing electrode of Soane et al. satisfies the criteria of an electrode within a “central region of the channel.” The present claims, as amended, however, recite a plurality of electrodes defining a perimeter of an array, with “at least one electrode disposed a central region within the perimeter of the array.” The circumscribing electrode of Soane et al., however, does not satisfy this criteria. Although the electrode of Soane et al. may define a “perimeter” around the channel, it is a *single* electrode, not a “plurality” of electrodes. Functionally, this difference is significant. Since the circumscribing electrode of Soane et al. is a single electrode, it is capable of only a single charge at any given moment. It cannot therefore function equivalently to a plurality of electrodes, which can be independently charged to generate electric fields in variable directions. The present invention is also distinguishable over Soane et al. because the electrode of Soane et al. is not “disposed in a central region within the perimeter of the array.” The claims define the “central region” of the array relative to a plurality of electrodes that constitute a “perimeter.” Because the circumscribing electrode of Soane et al. itself defines the perimeter (consisting of a single electrode), it cannot therefore logically satisfy the criteria of an electrode that is disposed within the perimeter defined by itself. Finally, even if the circumscribing electrode of Soane et al. is considered to define a “perimeter,” Soane et al. does not disclose any other electrode that is “disposed in a central region within the perimeter” defined by the circumscribing electrode. The presence of an electrode in a central region within the perimeter of the array also gives rise to an

important functional distinction, which is that the perimeter electrodes and the centrally located electrode can be charged independently. The electrode arrays of the prior art are limited to perimeter electrodes, which define a boundary beyond which the analyte molecules cannot migrate under an electric field. In contrast, the electrode arrays of the present invention include, in addition to the perimeter electrodes, a central electrode disposed within the perimeter electrodes. The analyte molecules can migrate past the centrally located electrode in any direction, which is not possible with a perimeter electrode. The claimed invention, which recites “at least one electrode disposed in a *central region within the perimeter of the array*,” is therefore distinguishable over the cited prior art, which does not teach or suggest this limitation.

In view of the above differences between the cited prior art and the claimed invention, Applicant respectfully submits that the claimed invention is neither disclosed nor suggested in the prior art, and therefore defines allowable subject matter.

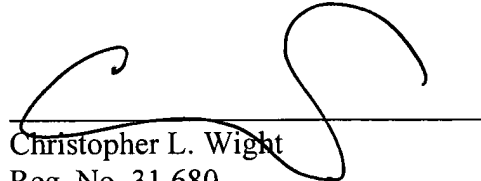
CONCLUSION

In conclusion, Applicant submits that the amended claims 24 and 29 now more particularly and clearly define subject matter that is distinguishable over the cited prior art references, and respectfully requests that the claims be allowed. New claims 38 and 39, which depend from amended claims 24 and 29, also recite a more specific embodiment, in which the array comprises a *plurality* of electrodes disposed in a central region of the array.

Independent claims 24 and 29, as amended, are therefore believed to be in condition for allowance. The remaining dependent claims 25-26, 28, 30-31, and 34-37, as well as new claims 38 and 39, are also believed to be in condition for allowance. Applicant respectfully request that all outstanding claims be allowed.

In the event that the examiner believes additional issues remain outstanding, he is encouraged to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Christopher L. Wight', is written over a horizontal line.

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